

Miller Freeman Log

Day 11

April 28, 2005

Jim Jenkins

Science and Technology Log:

CTD Tests

The past two days have been 12 hour workdays helping to do CTD tests. This involves putting an instrument into the water to measure the salinity, temperature and depth of the water in specific locations. All the data collected is stored in a computer file so that scientists can look at data the data for analysis.

I have an experiment that I would like you to try to see how salinity influences oceans. First, mix up some water with varying levels of salinity. You could do this by putting 1 teaspoon of salt in 100 ML of water, 2 teaspoons of salt in 100 ML of water, 3 teaspoons of salt in 100 ML of water and four teaspoons of salt in 100 ML of water. It would be a good idea to color these with a drop or two of the same color of food coloring. Label the cups and put them in order, least to greatest amount of salt.

Now, fill four cups with 100 ML of fresh water. It would be a good idea to put a drop or two of food coloring in these samples also. Make sure to pick a color that is different than the color used for the salt water samples.

Gently pour the fresh water samples down the side of the container into the salt water samples and record your observations. You may notice that the fresh water stays on top of the salt water because the salt water has a greater density than the fresh water. You are now on your way to understanding part of what CTD tests are all about. That is, saltier water tends to sink toward the bottom of the ocean while fresher water tends to be at the surface of the ocean.

You now may want to experiment with changing the temperatures of your specimens and recording your observations and thoughts. Your observations may lead you to conclude that colder water tends to sink while warmer water tends to rise. Understanding this will put you well on your way to understanding characteristics of sea water due to salt and temperature differences that are the basis of CTD tests.

Do you remember our discussion of the Walleye Pollock? You may remember that larva for the Pollock are in sea water and are influenced by currents which may transport the larva, or bring food to the larva. The rise and fall of water due to temperature and salinity differences causes some of the currents that transport larva, or bring food to the larva through upwelling. Understanding how oceans circulate because of salinity and temperature differences and how this circulation influences ocean life is the basis of the measurements collected by CTD tests.

Please let me know how your experiments go. What are your observations and questions?

Ocean Birds

Yesterday, the ship was close to an island and lots of birds were following the ship or playing around the ship. I spent some time on the bridge looking at the birds through binoculars and reading about them in a bird book kept on the bridge. Let me tell you about a few of the more interesting birds I saw.

The most interesting bird to me was a brown bird that resembled a puffin in some ways. These birds tended to be in front of the ship. They spent a lot of time flying, then would plop down into the sea to rest for a while. They are great floaters and bobbed well in the 8 foot swell waves. This bird is called the Northern Fulmar (*Fulmaris glacialis*). What do you think of the species name?

The Northern Fulmar has had a habit of following whaling ships to feed on offal or blubber thrown over the side.

A second bird, a gull, was larger and largely white. This bird, the Glaucous Gull, is also known as, "Chief magistrate of the North," because of some of its more peculiar habits. It has a habit of feeding on the eggs and unattended young of other birds. Its most curious habit is its tendency to confront a bird called an Eider which it forces to disgorge what it has eaten so that the Glaucous Gull can enjoy a good meal! What do you think of this?

Finally, the Laysan Albatross was a beautiful bird with a wonderful combination of straight edges and curves in its wings. This bird is an incredibly graceful flyer. Sailors and Pacific Islanders often refer to it as a "Gooney Bird." This albatross feeds mainly on squid and tends to live in the open ocean, well away from shore.

You might want to ask your parents about the albatross. They are likely to tell you some great stories and even entertain you with a few lines of a poem they know!

Ocean Waves

Yesterday, a notation in the log book read, "Confused Seas." Looking at the sea from the height of the bridge made this seem an apt description. Waves were bumping into other waves in locations causing sections of the ocean to be in churning turmoil.

I noticed that the ocean waves caused by local winds were in the 1-2 foot range. Larger waves, or swell waves, were in the 8 foot range. Discussion with the officers on deck helped me to understand that swell waves, like regular waves are generally caused by wind. The winds causing the swell waves tend to be further away, however. In fact, the swell waves coming to us yesterday might be the result of winds causing waves in the

water as far away as Japan. I think you might enjoy looking at a globe to fully appreciate this phenomenon.

Personal Log:

We are in transit today and are due to reach the site of a marine mammal mooring to be recovered tomorrow morning. It is nice to have the time to write logs and replies to you guys at a more leisurely pace.

Last night, I learned something about myself. Did you know that I smell, “greater than a toothpick and that I smell like a tree?” I thought that you would appreciate this description brought to you by 5 year old Sam Jenkins!

Question(s) of the Day: Which whale is capable of the deepest dive? Which whale can hold its breath the longest? How are the Gray Whale’s feeding habits different than the habits of other whales? (A great resource: <http://cet.usd.edu>) Mrs. English may be able to help you with other good web resources. It would also be a great idea to visit Mrs. Griffith in the library!

Fondly,

Mr. Jenkins









Miller Freeman Log
Day 13
April 30, 2005
Jim Jenkins

Latitude: 56, 17, 02 N
Longitude: 165, 42, 00 W
Visibility: 10 Nautical Miles
Wind Direction: 355 Degrees
Wind Speed: 14 Knots
Sea Wave Height: 1-2 Feet
Sea Wave Swell: 4 Feet
Sea Water Temperature: 3.6 Degrees C
Sea Level Pressure: 1024.0 Millibars
Cloud Cover: Cloudy

Science and Technology Log:

Marine Mammal Listening Device

Earlier, a marine mammal listening device scheduled for recovery could not be picked up because the instrument responded to signals and released from its anchor, but it did not rise to the surface for recovery. You may remember the theory was that it was stuck in the mud which prevented it from rising. Well, things changed on the second effort to pick up one of these devices. This one popped to the surface and is now onboard the ship. The data and sounds recorded will be of great interest to scientists at the Scripps Institution of Oceanography.

A couple of days ago, I sent some photos of brittle stars, bivalves, barnacles and worms that had gathered on a mooring that had been 200 meters deep in the Bering Sea for about a year. Were you as impressed with all the life forms as I was?

I expected to see life forms on the marine mammal listening device because it had also been beneath the water for 1 year. You may be surprised to learn that there was almost nothing on the surface of the entire instrument! Would you like to take an educated guess as to the reason for the lack of life on this mooring? You would be correct if you noted that this one was deployed at a deeper depth. In fact, this one was 1,800 meters deep.

The role of the sun in starting the process of photosynthesis to feed all life is pretty impressive isn't it? I hope this example helps you even more appreciate the role of penetration of sunlight into the water as a huge factor in ocean food chains.

Bongo Tows

Four bongo shaped nets were lowered into the water this morning to catch zooplankton. Two of the nets had a 60 centimeter diameter and 133 micron holes in them. This means that anything smaller than 133 microns simply passes through the net and is not collected. Lots of phytoplankton fall into this category and are not collected.

Two more nets had 20 centimeter diameter openings and nets which had 153 micron holes in them. Can you see that these nets are set up to catch smaller plankton species?

All nets were lowered to the bottom by a winch until they were 10 meters from the bottom. The nets are then pulled up to the surface by a winch at a rate of 20 meters per minute. All organisms are collected in a cylinder attached to the base of the net. The cylinders are removed from the nets, taken into the laboratory where they are put into bottles. The bottles are then sent to a lab in Poland where technicians use microscopes to identify the species, and the number of each species, in each sample.

Today's specimens had a lot of organisms visible to the naked eye. I will be forwarding a photo in which you may be able to make out some specimens. There were a few fish larva and even some squid larva.

Have you noticed that rivers around Virginia tend to have a greenish hue once algae populations begin to grow in the summer? Well, this process also happens in the Bering Sea. The size of the mesh on bongo nets is adjusted during the summer months because a larger amount of algae growing in the water tends to be picked up. These algae may even clog a net if too much is collected.

What can be determined by the small specimens collected in the bongo nets? For starters, finding a lot of zooplankton means that larger species are going to have more to eat. This could mean healthier populations and better fishing.

Eggs of fish collected in the tows give an indication of the future of fish populations. More eggs may mean more fish.

Our friend, the Walleye Pollock's, eggs soon turns to a larval form before developing into small fish. The larva of the Walleye Pollock has small ear bones called otoliths. These ear bones have growth rings in them which are similar to growth rings in trees. It is possible to determine the age of Pollock larva to the number of days by examining and counting the rings in its ear! Knowing the age and number of larva in the water can be extremely helpful in predicting the number of fish that are likely to be available for harvest in the future.

Argos Apex Drifters

Two instruments have been dropped into the water and they are probably not going to be recovered. In fact there will be no effort to recover them!

The first of these long yellow cylinders with satellite transmitters on the top was dropped into the water yesterday. At first, the instrument simply sat horizontally on the surface of the sea until it picked up a signal from a satellite in orbit. When the signal was received by the Argos Drifter, the instrument filled a bladder with water causing it to sit upright and sink into the sea. The instrument descends to depths of up to 2,800 meters. It then rises slowly to the surface, all the time collecting data on salinity. Upon reaching the surface, the instrument transmits all its data to the satellite. After transmission, the instrument dives again and repeats this process of collecting data for 8 or 9 months.

Plans are to have 3,000 or more of these instruments in the water of all the world's seas collecting data. Do you think that this is an improvement on having to actually travel to a particular site to collect salinity data?

Personal Log:

E-mails from home tell me of balmy warm weather and spring plants coming out in profusion. Conditions are a little different here today. Hands went back into pockets so that my they would not be made so inflexible by the cold that I could not use a pencil well to keep records when working on the deck this morning. A winter coat and felt liners in my boots felt wonderful. Do you think I may have some adjusting to do when I return to springtime in Virginia?

Several of you have asked about stars. It is getting dark rather late here, so I woke up the last couple of nights at 1:00 AM to take a walk on the deck to enjoy the stars. The weather has been pretty cloudy, so I could only see two stars as I walked around the deck. You would have appreciated the flat blackness of the sky, however. I can imagine the stars being quite radiant on a clear night. I will keep looking and let you know what I see.

Surimi Crab sandwiches were on the menu for lunch today. Being a big fan of the Chesapeake Blue Crab, I ordered a sandwich and found it delicious. After lunch, I went back to the kitchen to ask Chief Steward, Russell Van Dyke, to tell me about the Surimi crab. I was surprised to find out that there is no such thing as a Surimi Crab!

Russell was good enough to go down to the freezer to get a bag of Surimi Crab so that I could look at it. I discovered that the package contained only 20% of a crab product.

Now for the question of the day: What makes up the other 80% of Surimi Crab?

Have a wonderful weekend!

Mr. Jenkins

































